

## Notes from Urumqi meeting

August 12, 2017

Peter Timbie

### Status of data taking

- TAC has about 1 week NCP, Cyg A, Sun data, etc from dishes from May '16 and 1 day of cylinder data from Sept '16

- it would be very useful to collect more data with dishes of Sun, NCP, Cyg A; cylinders as well

### Shipping of disks

- when running we'll need to ship about 1, 4TB HDD/day

- Peter delivered 10, 6 TB disks to NAOC

- Peter will continue to find best way to ship disks back to TAC

### Data format

- cylinders are now 10 minute files, 22.4 GB

- dish data is now 1 hr files, 187 GB/day

- Albert suggest that it would be more convenient to separate each visibility into single files over longer period

- this can be done after data arrives at TAC

- compress in time (by factor 60) and freq (by factor 4) - see Albert's talk

### TAC status

- plan is to work with the pipeline Shifan has developed rather than building a parallel one for comparison

- Santanu will go through code and document sections, requesting help from Shifan

- insert references to algorithms used

- Albert recommends TAC purchase more computing power both for analysis and for beam simulations

### Status of Instrument - see talks by Jixia Li and Fengquan Wu

- noise calibration source temperature now under control - should be more stable

- there is naturally some structure in the spectrum emitted by the discone

### antenna

- simultaneous observation with dish and cylinders are possible

- in principle, system can be run remotely

- is calibrator/noise source in the linear regime? observations of Cyg appears

### not

- lots of EMI found/removed (analog power supply replaced digital supply, etc.)

### Beams-

- beam simulations to be verified and posted on wiki by Peter

- need to compare to measurements; Juyong could help with this - will be in

Madison for a year

- Chime sees E-W shift b/c each feed at single dec sees small fraction of cylinder (not a feed alignment problem)

How to measure beams:

- holography between cylinders and dish array? Need to fix noise from dish motors first
- drone? Fengquan and Juyong are planning to purchase

FRB/pulsar searches - see talk by Fengquan

- FRB backend is being studied by Institute of Automation

Dish analysis

- NCP analysis - see talk by Albert
  - he has developed a Mathematica notebook to allow a 'quicklook' of the data
    - will post on website
  - see talk by Santanu
    - should try to average over smaller bandwidth - fringes may be averaging out across band
      - NCP data - signal seen in one data set doesn't appear 2 weeks earlier
      - E&M sims correspond to sun data?
  - see talk by Shifan
  - Albert recommends making 'snapshot' maps rather than full maps as a first step
    - can step through these snapshots to make a movie of sources moving through the beams

Future directions? Discussion led by Jeff

- we could create a foreground map of the Galaxy - does not yet exist - Albert
- extend surveys to  $z < 6$ ? more volume than galaxy surveys, more interesting for non-lambda dark energy models
- pulsar discoveries: search for low  $\dot{p}$  pulsars - most useful for GW searches
  - then can monitor - 20 mins/day
- FRB's
  - could cover larger sky fraction by deploying a dense array of feed antennas. still need to build a backend for de-dispersion
- NCP spectroscopic survey to magnitude 18 galaxies
  - can LAMOST do this?
  - Israel telescope
- CO, C+, Ly-alpha cross-correlation
- Tianlai survey could be cross-correlated with LSST to provide better redshift information (even though we have much poorer angular resolution)

Publications

- we should write a short paper about first results soon
  - publish in JAI? or, SPIE Astronomical Instrumentation (meeting in summer '18)

Future meetings:

- data analysis meetings (TAC) will be organized by Santanu. 2 x/month
- we should start planning next year's meeting early - in January